

## 1. Field of the Invention

## 2. Description of the Related Art

Examples of this type of radiation image information recording and reproducing system include, for example,

systems such as those proposed in JP 63-253348 A, JP 01-227139 A, JP 04-123173 A and JP 04-155581 A by the present Assignee. In such a system, an image of a patient is captured at a hospital, for example, by means of an X-ray image capturing device or the like, radiation image information pertaining to this patient, for example, is stored and recorded on a sheet of a stimuable phosphor, and this sheet is scanned by means of a laser or other such excitation light to generate photostimulated luminescence light; and the system is provided with a radiation image reading device for photoelectronically reading the photostimulated luminescence light which has been obtained in this way and thereby obtaining image data; an identification information registration device for registering the patient's identification information; and an image recording device for recording a radiation image onto a photographic photo-sensitive material or other such recording material, for example, as a visible image based on the obtained image data, in connection with the registered patient's identification information and the like.

In this type of conventional radiation image information processing system, before the image of the patient is captured or at the time when the image is

captured, the region t  
the image was captur  
m the stimulable phos  
captured, and other su  
g of the image.  
er hand, information  
e ID terminal to the  
istered identificatio

captured, the region t  
the image was captur  
m the stimulable phos  
captured, and other su  
g of the image.  
er hand, information  
e ID terminal to the  
istered identificatio

destination for the outputted radiation image, such as an internist's office or surgeon's office or other such particular medical specialist's office in a hospital, for example.

Also, the radiation image reading device reads the bar code on the back surface of the stimuable phosphor sheet and establishes a correspondence (relationship) with the patient's ID information which has been obtained from the ID terminal, and also reads from the stimuable phosphor sheet the radiation image information which was captured onto this stimuable phosphor sheet, performs the image processing and the like in accordance with the conditions which have been received and sends to the image recording device the processed radiation image which has thus been produced, outputting this image together with the output conditions. At the image recording device, the processed radiation image is outputted, according to the obtained output conditions, as a transparent film image equivalent to an X-ray image or reflective paper image or other such hard copy image. The outputted radiation image is distributed by means of a well known means to the distribution destination which was obtained from the ID terminal.

In the conventional radiation image information

processing system disclosed in the above-mentioned publications, the radiation image reading device can read vast amounts of the stimuable phosphor sheet, and due to reduced costs, it is possible to use a plurality of radiation image reading devices; accordingly, not only is it possible to connect one of or a plurality of the radiation image reading devices to a plurality of ID terminals and position the ID terminals close to the radiation image capturing device, but also it is possible to place the ID terminals close to the reception desk or other part of the hospital or the various specialists' offices, for example, thereby improving the ease and efficiency of the inputting of the patient information and the cross-checking of the patient information against the stimuable phosphor sheet at the capturing device. Alternatively, it becomes possible to perform the reading of the stimuable phosphor sheet by any radiation image reading device, regardless of which ID terminal the stimuable phosphor sheet was registered in, thus enabling the efficient running of a plurality of radiation image reading devices.

Further, in the conventional radiation image information processing system disclosed in the above-mentioned publications, it is possible to connect a

plurality of ID terminals, which are connected to one or more radiation image reading devices, or a plurality of ID terminals which are each individually connected to one of a plurality of radiation image reading devices to a single managing device (such as a host computer or manager ID terminal), or connect a plurality of radiation image reading devices to a single ID information input storage unit, and thus realize integrated management of the ID information, and also it becomes possible to perform integrated management of the running status of the radiation image reading device and the image recording device, and the usage status of the stimulable phosphor sheet, and thus manage the efficient running of the radiation image reading device and the efficient use and longevity of the stimulable phosphor sheet and the like. At this time, one or more image recording device may be connected to the one or more radiation image reading devices, and thus the efficient running of the image recording device is enabled.

However, in recent years, even in this type of conventional radiation image information processing system, what is used for the image output device, which outputs the radiation image as a visible image, is not only an image recording device for recording onto the recording material,

but also an image display device for performing a monitor-type display on an LCD, CRT or the like for review of the radiation image. Also, this type of image display device is now physically set up as in image review device in each specialists' office in the hospital or such, and is also set up for each physician, image inspection engineer or other type person who is to inspect the image.

Therefore, not only is the outputted hard copy image distributed to the particular specialist's office in the hospital or other such distribution destination, but also, in order to make the diagnosis more efficient, to shorten the amount of time that the patient has to wait and to speed up the medical care, the radiation image which has been read by the radiation image reading device and has been subjected to the image processing and the like is now also sent as image data for review (i.e., display) purposes to such distribution destinations as the image review devices and the like which are set up at each specialist's office or set up for each person who is to inspect the image.

In the conventional radiation image information processing system described above, the image is handled ultimately in per-image units, and it must be recognized that in recent years this has become an inconvenience since

a single inspection has now come to involve several images or more.

#### SUMMARY OF THE INVENTION

The present invention is to be developed in light of this development whereby several images or more are used in a single inspection, and an object of the present invention is to provide an image and information processor in which the images are not handled in per-image units, but are handled in units of the several or more images to be used in the single inspection.

In order to attain the object described above, the present invention provides an image and information processor comprising: an image information processing unit having a function for inputting patient information and radiation image capture information related to the patient information; a function for receiving at least one first radiation image having been read by means of a radiation image reading device; and a function for performing image processing on the at least one first radiation image having been received from the radiation image reading device; an image display device which is connected to the image information processing unit and displays at least one of the at least one first radiation image and at least one

second radiation image having been subjected to the image processing by the image information processing unit; and an external storage device which is connected to the image information processing unit and stores temporarily at least one of the at least one first radiation image and the at least one second radiation image in relation to the patient information; wherein the image information processing unit is constructed such that a serial radiography based on a plurality of radiographic conditions of the image capture information relating to one patient inputted by means of the input function can be reserved as a single inspection.

Preferably, the image information processing unit is connected via a network to the radiation image reading device or radiation image reading devices and one or more image output devices for outputting the at least one second radiation image.

Preferably, the plurality of radiographic conditions of the radiation image capture information which are reserved as the single inspection are displayed in a single screen as tags, each corresponding to each of the plurality of radiographic conditions.

Preferably, when the serial radiography is begun and the radiation image corresponding to each of the plurality of radiographic conditions is stored, a thumbnail image of

the radiation image is displayed in relation to a tag of the tags.

Preferably, a relationship between the tag and the thumbnail image can be altered or exchanged by moving the thumbnail image that has been displayed related to the tag.

Preferably, consecutive numbers are assigned to radiation images pertaining to the single inspection according to order that the tags are arranged in, and this display sequence in which the radiation images are displayed is controlled by the consecutive numbers.

Preferably, consecutive numbers are assigned to radiation images pertaining to the single inspection according to order that the tags are arranged in, and when the radiation images are outputted, this output sequence is controlled by the consecutive numbers.

In order to attain the object described above, the present invention provides an image and information processor, comprising; the one or more radiation image reading devices for reading a radiation image; an image information processing unit having a function for inputting patient information and radiation image capture information related to the patient information; a function for receiving at least one first radiation image having been read by means of one or more radiation image reading

devices; and a function for performing image processing on the at least one first radiation image having been received from the one or more radiation image reading devices; an image display device which is connected to the image information processing unit and displays at least one of the at least one first radiation image, and at least one second radiation image having been subjected to the image processing by the image information processing unit; and an external storage device which is connected to the image information processing unit and stores temporarily at least one of the at least one first radiation image and the at least one second radiation image in relation to the patient information; wherein the image information processing unit is connected via a network to the one or more radiation image reading devices and one or more image output devices for outputting the at least one second radiation image; and wherein the image information processing unit is constructed such that a serial radiography based on a plurality of radiographic conditions of the radiation image capture information relating to one patient inputted by means of the input function can be reserved as a single inspection.

## BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

Fig. 1 is a diagram depicting an outline construction of an independent-type (stand-alone) IIP incorporating an image information processing device thereinto, according to one embodiment of the present invention;

Fig. 2 is a diagram depicting an outline construction of an IIP connected to a network and incorporating the image information processing device thereinto, according to one embodiment of the present invention;

Fig. 3 is an operations flow chart depicting one example of a flow of operations for making a reservation for an inspection from an IDT;

Fig. 4 is a diagram depicting a specific example of an image capture screen which is outputted and displayed on a screen of an image display device inside the IIP;

Fig. 5 is a diagram depicting a monitor screen on the image display device inside the IIP as it is in a state when the image capturing has proceeded to a second image;

Fig. 6 is a diagram depicting one example of operations in a case where an "end inspection" button depicted in Fig. 5 is pressed;

Fig. 7 is a diagram depicting one example of operations in a case where an "new image" button depicted

in Fig. 5 is pressed; and

Fig. 8 is a diagram depicting one example of operations in a case where an "retake image" button depicted in Fig. 5 is pressed.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Hereinafter, explanation will be made of an embodiment of the present invention, making reference to the attached drawings.

Fig. 1 is a diagram depicting an outline construction of an independent-type (i.e., stand-alone) image information processing system using an image and information processor (referred to hereinafter as IIP) according to an embodiment of the present invention, and Fig. 2 is a diagram depicting an outline construction of an image information processing system constructed by connecting via a network to the IIP according to the embodiment of the present invention.

As depicted in Fig. 1, an IIP 10 according to the first embodiment is comprised of an information input unit 12 for inputting patient information, radiation image capturing information which is related or linked to this patient information, and the like; an information receiving unit 14 for receiving the radiation image taken by means of

09989407-44044  
T070704

a radiation image reading device 24 described below; an image information processing unit 16 for performing image processing on a radiation image received from the radiation image reading device 24; an external storage device 18, which is connected to the image information processing unit 16 and which temporarily stores the radiation image before or after it has been subjected to the image processing by the image information processing unit 16 in relation to the patient information; an image display device 20, which is connected to the image information processing unit 16, and which is for displaying the radiation image before and after it is subjected to the image processing. Note that reference numeral 22 indicates an image output device being connected to the above-mentioned image information processing unit 16, reference numeral 24 indicates the radiation image reading device and reference numeral 26 indicates a radiation image capturing device.

Further, as depicted in Fig. 2, an IIP 10A according to the second embodiment 2 has almost the same construction as the IIP 10 depicted in Fig. 1, and generally there are more than one of each of the following connected to the network: the IIP 10A, the image output device 22, the radiation image reading device 24, the radiation image capturing device 26, image saving device 28, a workstation

(hereinafter, referred to as WS) 30 for viewing the images and the like, and an ID input terminal (hereinafter, referred to as IDT) 32.

Note that the IIP 10 and the IIP 10A depicted in Fig. 1 and Fig. 2 have mutually different formats for receiving the image from the radiation image reading device 24, but their substantial operations are exactly the same, so the explanation of the operations of the present embodiment will be made in detail regarding the image information processing system, including the IIP 10A depicted in Fig. 2.

The information input unit 12 has substantially the same functions as the IDT 32 mentioned above, and it is for inputting the patient information and the radiation image capturing information which is to be used for the inspection, and which has been linked to the patient information. Note that the patient information to be inputted (i.e., ID information) includes, for example, the patient's first and last name, sex, date of birth, ID number and the like, and the radiation image capturing information includes a year, date and month on which the image was captured, a region that was captured, a method used to capture the image, bar code information from a stimuable phosphor sheet onto which the image was captured, a distribution destination to which the radiation image is

to be sent (such as the office of the specialist who requested the image), conditions for performing the image processing, and the like.

The image information processing unit 16 has such functions as a function for receiving the radiation image before it is subjected to the image processing which was read by means of the radiation image reading device 24 discussed below; a function for performing image processing on the unprocessed radiation image which has been received from the radiation image reading device 24 and not yet subjected to the image processing, this image processing being image processing which is appropriate for outputting the image, or image processing which is performed according to image processing conditions which are configured in advance in the image capturing information; and a function for distributing a radiation image which has been subjected to the image processing to at least one of the plurality of WSs 30 and the image saving device 28.

Additionally, the image processing unit 16 has a function inside this IIP 10A for storing at least the inputted patient information into the external storage device 18 in a searchable state, and then the next time and thereafter, using a part of the patient information as a search term to search the external storage device 18 to

09989407 112101

read out the corresponding patient information from the patient information stored in the external storage device 18. In the case where there was a change in the patient information it is sufficient to update this information and store it in the external storage device 18. By doing this the procedure of inputting the patient information becomes more efficient and the burden on the operator is alleviated.

The external storage device 18 is a device for linking either one of or both of the unprocessed radiation image received from the radiation image reading device 24 and the processed radiation image which has been subjected to the image processing by the image information processing unit 16 to the patient ID information including the patient information and the image capturing information which were inputted into the image information processing unit 16, and then temporarily storing these into a temporary storage device. Note that it is better to have many radiation images be temporarily stored in the external storage device 18, and further, it is better for the storage period to be long; however, these conditions are not particularly limitations, and so they may be chosen appropriately in accordance with storage capacity and costs and the scale of the hospital or such which is to use the images. Note that at least the patient information is stored in the external

03939402 442444

storage device 18, being stored in a format such that it is searchable by the image information processing unit 16, using a part of the patient information as a search term.

The image display device 20 is for displaying the patient information, the image capturing information and other such ID information which the operator has inputted and registered in advance into the image information processing unit 16, at the time when they are inputted or after they were inputted for purposes of confirmation, and further, displaying one of or both of the unprocessed radiation image received from the radiation image reading device 24 and the processed radiation image which has been subjected to image processing by the image information processing unit 16 in relation to the above-mentioned ID information, or together with a part of or all of the ID information. The image display device 20 which is to be used in the present embodiment is not particularly limited, and so a CRT display device, LCD (monitor), plasma display or other such well known display or monitor may be used; but in the case where the display device is to be used for the display of images for medical diagnosis purposes it is preferable to use an image display device which is capable of displaying high-resolution images.

The image output device 22 is for

recording/outputting the processed radiation image as a visible image onto a photographic photo-sensitive material (i.e., photo-sensitive film) or the like, for example, in relation to the patient's ID information and the like, that is, by establishing a relation or a correspondence between this radiation image which is printed out as a visible image and the patient's ID information and the like. One or more of these image output devices 22 are typically connected via the network 34. Note that the image output device 22 may receive from the image information processing unit 16 and through the network 34 an image data signal for the unprocessed radiation image which was read by the radiation image reading device 24, and output this unprocessed radiation image.

The image output device to be used in the present invention is not particularly limited, but it is desirable to use a device which can perform recording and outputting of a hard copy image which has qualities which are equivalent to those of X-ray film images which are used for medical diagnosis. Typical examples of this sort of recording device include devices which scan and expose photographic photo-sensitive material (i.e., photosensitive film) by means of a modulated light beam such as a laser beam modified in accordance with the image data signals of

the radiation image received from the image information processing unit 16, then record a latent image, expose photo-sensitive material which has been exposed by exposure processing, and then output the radiation image as a hard copy image; or devices in which the image is recorded and outputted onto heat-sensitive material (i.e., thermal film) by means of a thermal recording head (i.e., thermal head) which is modulated in accordance with the image data signals of the radiation image, or by means of a heat mode laser which is modulated in a similar fashion.

Note the above-mentioned photo-sensitive material and heat-sensitive material is not particularly limited, either, but it is preferable to use photo-sensitive film and heat-sensitive film, and examples of the material include silver salt photographic photo-sensitive materials, photo-sensitive heat development materials, various heat-sensitive materials or other such materials which can be used in wet exposure processing and dry exposure processing.

Also, for the image output device of the present invention it is also possible to use such well known image recording devices as an electrophotographic image recording device for transferring an image to image-receiving materials by using photo-sensitive bodies and toner, or an image recording device which uses a format whereby the

image is transferred to image-receiving materials by means of a sublimation (ablation) process.

The WS 30 is an output device for using the image data signal of the processed radiation image which has been subjected to the image processing and which was received from the image information processing unit 16 through the network 34, using this image data signal to display the radiation image, which is to be used for the medical diagnosis, displaying this signal on a display screen as a soft copy image in a way such that the signal is either displayed linked to the patient's ID information, or displayed together with a part of this ID information. In the depicted example, the plural numbers of WSs 30 are connected to the image information processing unit 16 through the network 34; however, the present invention is not limited to this configuration, and it is sufficient to have one or more WS 30 units connected. Here, it is also possible to configure the WS 30 so that it receives the image data signal of the unprocessed radiation image which has not yet been subjected to the image processing and which was read by means of the radiation image reading device 24, receiving this signal from the image information processing unit 16 through the network 34, and then displays the signal on the display screen.

The image saving device 28 is one type for image output device for storing and saving on a long term basis as an radiation image database at least one of the image data signal of the processed radiation image which has already been subjected to image processing and which was received from the image information processing unit 16 through the network 34 and the image data signal of the

The image saving device 28 is one type for image output device for storing and saving on a long term basis as an radiation image database at least one of the image data signal of the processed radiation image which has already been subjected to image processing and which was received from the image information processing unit 16 through the network 34 and the image data signal of the

unprocessed radiation image before it is subjected to the image processing in relation to the patient's ID information. Here, the image saving device 28 functions as a database of radiation images, so it is desirable to provide this as one type of image output device for the present system; however, if there is no need to provide a database for radiation images, then it is not necessary to provide these. The capacity of the image saving device 28 (i.e., the database capacity) is not particularly restricted, and it is sufficient to select the capacity appropriately in light of the scale of the processing system.

Further, the radiation image data can be stored into the image saving device 28 at any time; however, if the image saving device is also to be given a function of performing backups, then it is good to store the radiation image data at the time when they are temporarily stored to the external storage device 18, but due to circumstances regarding the storage capacity of the image saving device 28, it may be good to save the radiation image data at the time when they are deleted from the external storage device 18. Note that there is no particular limitations on the types of radiation image which are to be stored in the image saving device 28 as the database, and so it is

possible to save all the images which are to be saved in the external storage device 18; however, it is also possible to select a portion therefrom to save. The selection of the radiation image which is to be saved into the image saving device 28 can be made at the time when the temporarily saved radiation image is deleted from the external storage device 18.

The IDT 32 is a terminal which is equipped with a keyboard and mouse for inputting, and a monitor, and it is to be used for doing such things as inputting and confirming the patient information, the image capturing information and other such patient ID information, and it can be used, instead of the image information processing unit 16 of the IIP 10A, which is inside the system according to the present embodiment, for doing such things as inputting the patient's ID information, or inputting a portion of the patient's ID information which has not been inputted by means of the image information processing unit 16, then sending this information through the network 34 to the image information processing unit 16 to register it and storing it into the external storage device 18, or using a portion of the patient's ID information which is registered in the image information processing unit 16 to search the external storage device 18 which is connected to the image

information processing unit 16, and then cross-checking and confirming a portion of or all of the ID information, or obtaining a portion of or all of the patient's ID information from a magnetic card which has been issued to the patient, and performing searching, cross-checking, confirmation, and the like.

It is also possible to make a reservation for an inspection from the IDT 32. A reservation for an inspection is typically performed by the doctor from one of the WS 30 units in each of the specialist's offices; however, when a prescription for an inspection has been given, for example, there could be cases in which an operator in another department actually performs the input. As described above, in recent years there are many cases in which the inspection generally includes more than one image taken for a given patient, so it is efficient to adopt a method in which the content of the inspection is reserved by means of an input from the IDT 32, and then an engineer from the department specializing in the taking of the images reads out the content of the inspection and makes a reservation for a specific kind of image-taking session. Note that in the actual operations it is good to prepare a screen, such as is described below, which is only used for the purpose of making inspection reservations, and then

make selections from this screen in sequence to determine the content of the inspection from selections appearing on the screen, and then input necessary itemized information.

In the case where the invention is to be used frequently in the way described above, it is desirable to arrange the IDT 32 at each of the devices other than the IIP, which means it is arranged at the radiation image capturing device 26, the reception desk in the hospital, the reception desks at each of the specialists' offices, etc., and to thereby facilitate to conduct the input operations and the making of the reservation for the inspection. Additionally, the IDT 32 can be arranged at the radiation image reading device 24, the image output device 22 and the image saving device 28. By adopting this arrangement, the operations of inputting and of reserving the inspection content can become more efficient, and the load on the operator can be alleviated.

Note that a LAN, VAN, or other such format can be used as the construction for the network 34 which connects each of the above-mentioned devices to each other; however, in the present invention there is no particular restriction as to the method by which the network is constructed, and it is possible to use a communications network other than the ones mentioned.

09589407-443404

The image information processing system incorporating the image information processing unit therein according to the present embodiment is basically constructed as described above, but the operations thereof are explained hereinafter, using as examples the inspection reservation from the IDT 32 and the process of executing the inspection based on this inspection reservation. Note that it is assumed here that a given patient has submitted an inspection prescription to the radiologist's reception desk, and the inspection reservation is to be performed by means of the IDT 32 mentioned above. The operation flow chart depicted in Fig. 3 will be used to explain this in detail.

Fig. 3 depicts an operation flow for a reservation for an inspection, which is to be made by using the IDT 32. A function which is inside the image information processing unit 16 and which is for receiving the inspection reservation monitors the inspection reservation request (step 101), and then when there is a request (i.e., case Y at step 101) this function displays an inspection reservation screen (step 102). The operator of the IDT 32 uses this inspection reservation screen to input the image capturing information in sequence, based on inspection content which appears on the inspection reservation screen and which corresponds appropriately to the content to be

inspected. At this time, it is sufficient to have the operator typically acknowledge default conditions, and then input conditions by hand only in the case where the operator desires conditions which are different from these default conditions. As described below, the image capturing conditions (of the image capturing information) which are configured here can include a region of the patient which is to be captured, a direction from which the image is to be captured (including so-called AP and PA), a size, and the like.

When one of the image capturing conditions is completely established (i.e., case Y at step 103) then a request is made for the input of the next image capturing condition and this process is repeated (i.e., case Y at steps 103 and 104). When all of the image capturing conditions which have been planned are inputted, then the inspection request receiving function receives and registers these as being for a single inspection (step 105).

The content of the inspection reservation which is inputted as described above is transferred through the network 34 to the IIP 10A. Once the inspection reservation content has been transferred to the IIP 10A, then the content thereof is outputted as a display on the screen of the image display device 20, and also, instructions are

09589467-11101

At the radiation image capturing device 26, when the image capturing actually starts the images which are captured are sent in sequence to the radiation image reading device 24, and the images are read. Here, as one example, a configuration is adopted in which the image which has been read (i.e., the image before it has been subjected to the image processing by the image information processing unit 16) is displayed in real time, and then when the entire image has been read and the image

processing has been completely performed on this image, the above-mentioned image is replaced with the image that has been completely subjected to the image processing; however, the present invention is not limited to this configuration.

Fig. 5 depicts a monitor screen as it is in the state when the image capturing has proceeded to the second image. What is depicted in Fig. 5 is the situation in which a single frontal thoracic image which has been subjected to the image processing and was captured as a first image is displayed in the image display region 40b, and at the present time, the second image capture has been completed and the image processing is being performed on this second image by the image information processing unit 16. Note that in the present embodiment, once the entire image has been read out then thumbnail images (i.e., reduced-size versions) 41a to 41e are created, and these thumbnail images are displayed in the front portion of the capture menu to which that thumbnail image corresponds among the above plurality of capture menus. In Fig. 5, the thumbnail image of the image which corresponds to the second image capture is being displayed.

A comparison of the capture menu columns in Fig. 4 and Fig. 5 reveals that the capture menu in Fig. 4 indicates that the second image was taken of an external

view of the skull area; however, in Fig. 5 the second image was taken of an external view of the pelvis area. This is a necessary point to notice. According to the procedure for capturing the radiation images, the image which is easiest to take after the first image of the frontal thorax is given precedence, and so, as a result, in this case the capture menu (i.e., tags) are reordered on the image display screen 20 so that they correspond with the order in which the images are captured. This is effective for making it easy to determine how much of the entire image capturing work has been completed; however, the present invention is not necessarily limited to this configuration.

Note that the above-mentioned reordering of the capture menu (i.e., the tags) can also be performed in the case where the image is captured in a mistaken order. In such a case, in order to modify the relationship or the correspondences between the thumbnail images and the capture menu (i.e., tags), it is possible to apply a method in which the two thumbnail images which ought to be reordered are reordered by giving instructions for them, another method in which the thumbnail images which ought to be reordered are dragged (i.e., pulled and made to move) to the positions they would be in after the reordering, or the like.

Further, in Fig. 5, an image for which the results of the second image capture are not yet being indicated is not yet being displayed because it is being subjected to the image processing at the image information processing unit 16, and only the thumbnail image thereof is being displayed. This is to provide detailed information about the progress of the capturing of the images, and it is also effective for discovering mistakes in the image capturing (i.e., such as taking images of the wrong region, taking images from the wrong angle) at an early stage.

When other instruction buttons depicted in Fig. 5 are pressed, for example, an "end inspection" button 40d, a "new image" button 40e, a "retake image" button 40f, an "add" button 40g, then an application which corresponds to each of these buttons is booted, and the desired process is executed. Hereinafter, several examples thereof will be given.

In the case where the "end inspection" button 40d is pressed, an operation such as the one depicted in Fig. 6 or the like is performed. Namely, the image is outputted together with an image output mode which is to be performed at the end of the inspection. Examples of this image output mode include a sending mode in which all of the images are sent through the network 34 to a designated WS

30 (which is at the specialist's office which requested the image to be taken) (step 51), a mode in which the image is temporarily stored in the external storage device 18 (step 52) or other modes (step 53).

The "new image" button 40e is for inputting instructions in the case where, for example, a new image capture is to be added which does not use the same image capture conditions which had been used up until that point. When this button is pressed, screens are displayed one after another for selecting conditions ranging from such things as the new region to be captured, to the angle and size of the image to be captured, so the operator only has to respond to these screens to set the new capture conditions. Fig. 7 depicts one example of the process flow.

The "retake image" button 40f is used when the operator sees the image which has been captured and displayed, notices that there is some sort of mistake, and wants to change the image capture conditions (i.e., such as in the case where the original settings were not correct, or because the operator discovered better image capture conditions after taking the image), or wants to retake the image without changing the image capture conditions (i.e., such as in the case where the subject moved inadvertently during the taking of the image). Fig. 8 depicts one

example of this process flow.

The "add" button 40g is used in the case where an image capture is to be added in a similar fashion as in the case of the "new image" button 40e, but the difference from the case of the "new image" button 40e is that this button is an effective button in the case where the operator wishes to increase the quantity of the images captured using the same image capture conditions (i.e., such as the case where contrast media or such are used in the taking of the image, but the speed at which the contrast media are to move is predicted inaccurately as images are captured one after the other while the contrast media are moved).

Similar instruction buttons can be increased one after another as needed, and the content of the programs associated with the buttons can be altered appropriately.

Further, numbers can be applied to the image capture menu in sequence along the image capture menu (i.e., tags) array such as those depicted in the above-mentioned display screen (see Fig. 5, etc.), and this can be used effectively to produce the result that one image from among images from a single inspection can be designated in connection with these numbers, in order to use these numbers to specify an order in which the display output is to be performed or in which the hard copies are to be made.

Note that the above embodiment is one example of the present invention, and, of course, the present invention is not limited to this embodiment, but various improvements and alterations can be made without departing from the essential scope of the present invention.

For example, in the above embodiment an example of the present invention is given in which the image information processing system includes the IIP which is connected to the network; however, the present invention can be used with an independent structure, as well.

As described in detail above, the present invention provides an image and information processor which can be used preferably even in the case where a single inspection uses several or more images, and it achieves an obvious effect such that when the images are to be handled they can be handled in units going from one image at a time to several or more images which are to be used in connection with a single inspection.

More specifically, whether the image and information processor is in the independent structure (stand-alone) or is connected to the network, the sequence of operations during the course of the inspection can be executed easily in either case, including the configuration of the image capture conditions (image capturing information) which are

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65  
66  
67  
68  
69  
70  
71  
72  
73  
74  
75  
76  
77  
78  
79  
80  
81  
82  
83  
84  
85  
86  
87  
88  
89  
90  
91  
92  
93  
94  
95  
96  
97  
98  
99  
100  
101  
102  
103  
104  
105  
106  
107  
108  
109  
110  
111  
112  
113  
114  
115  
116  
117  
118  
119  
120  
121  
122  
123  
124  
125  
126  
127  
128  
129  
130  
131  
132  
133  
134  
135  
136  
137  
138  
139  
140  
141  
142  
143  
144  
145  
146  
147  
148  
149  
150  
151  
152  
153  
154  
155  
156  
157  
158  
159  
160  
161  
162  
163  
164  
165  
166  
167  
168  
169  
170  
171  
172  
173  
174  
175  
176  
177  
178  
179  
180  
181  
182  
183  
184  
185  
186  
187  
188  
189  
190  
191  
192  
193  
194  
195  
196  
197  
198  
199  
200  
201  
202  
203  
204  
205  
206  
207  
208  
209  
210  
211  
212  
213  
214  
215  
216  
217  
218  
219  
220  
221  
222  
223  
224  
225  
226  
227  
228  
229  
230  
231  
232  
233  
234  
235  
236  
237  
238  
239  
240  
241  
242  
243  
244  
245  
246  
247  
248  
249  
250  
251  
252  
253  
254  
255  
256  
257  
258  
259  
260  
261  
262  
263  
264  
265  
266  
267  
268  
269  
270  
271  
272  
273  
274  
275  
276  
277  
278  
279  
280  
281  
282  
283  
284  
285  
286  
287  
288  
289  
290  
291  
292  
293  
294  
295  
296  
297  
298  
299  
300  
301  
302  
303  
304  
305  
306  
307  
308  
309  
310  
311  
312  
313  
314  
315  
316  
317  
318  
319  
320  
321  
322  
323  
324  
325  
326  
327  
328  
329  
330  
331  
332  
333  
334  
335  
336  
337  
338  
339  
340  
341  
342  
343  
344  
345  
346  
347  
348  
349  
350  
351  
352  
353  
354  
355  
356  
357  
358  
359  
360  
361  
362  
363  
364  
365  
366  
367  
368  
369  
370  
371  
372  
373  
374  
375  
376  
377  
378  
379  
380  
381  
382  
383  
384  
385  
386  
387  
388  
389  
390  
391  
392  
393  
394  
395  
396  
397  
398  
399  
400  
401  
402  
403  
404  
405  
406  
407  
408  
409  
410  
411  
412  
413  
414  
415  
416  
417  
418  
419  
420  
421  
422  
423  
424  
425  
426  
427  
428  
429  
430  
431  
432  
433  
434  
435  
436  
437  
438  
439  
440  
441  
442  
443  
444  
445  
446  
447  
448  
449  
450  
451  
452  
453  
454  
455  
456  
457  
458  
459  
460  
461  
462  
463  
464  
465  
466  
467  
468  
469  
470  
471  
472  
473  
474  
475  
476  
477  
478  
479  
480  
481  
482  
483  
484  
485  
486  
487  
488  
489  
490  
491  
492  
493  
494  
495  
496  
497  
498  
499  
500  
501  
502  
503  
504  
505  
506  
507  
508  
509  
510  
511  
512  
513  
514  
515  
516  
517  
518  
519  
520  
521  
522  
523  
524  
525  
526  
527  
528  
529  
530  
531  
532  
533  
534  
535  
536  
537  
538  
539  
540  
541  
542  
543  
544  
545  
546  
547  
548  
549  
550  
551  
552  
553  
554  
555  
556  
557  
558  
559  
560  
561  
562  
563  
564  
565  
566  
567  
568  
569  
570  
571  
572  
573  
574  
575  
576  
577  
578  
579  
580  
581  
582  
583  
584  
585  
586  
587  
588  
589  
590  
591  
592  
593  
594  
595  
596  
597  
598  
599  
600  
601  
602  
603  
604  
605  
606  
607  
608  
609  
610  
611  
612  
613  
614  
615  
616  
617  
618  
619  
620  
621  
622  
623  
624  
625  
626  
627  
628  
629  
630  
631  
632  
633  
634  
635  
636  
637  
638  
639  
640  
641  
642  
643  
644  
645  
646  
647  
648  
649  
650  
651  
652  
653  
654  
655  
656  
657  
658  
659  
660  
661  
662  
663  
664  
665  
666  
667  
668  
669  
670  
671  
672  
673  
674  
675  
676  
677  
678  
679  
680  
681  
682  
683  
684  
685  
686  
687  
688  
689  
690  
691  
692  
693  
694  
695  
696  
697  
698  
699  
700  
701  
702  
703  
704  
705  
706  
707  
708  
709  
710  
711  
712  
713  
714  
715  
716  
717  
718  
719  
720  
721  
722  
723  
724  
725  
726  
727  
728  
729  
730  
731  
732  
733  
734  
735  
736  
737  
738  
739  
740  
741  
742  
743  
744  
745  
746  
747  
748  
749  
750  
751  
752  
753  
754  
755  
756  
757  
758  
759  
760  
761  
762  
763  
764  
765  
766  
767  
768  
769  
770  
771  
772  
773  
774  
775  
776  
777  
778  
779  
780  
781  
782  
783  
784  
785  
786  
787  
788  
789  
790  
791  
792  
793  
794  
795  
796  
797  
798  
799  
800  
801  
802  
803  
804  
805  
806  
807  
808  
809  
810  
811  
812  
813  
814  
815  
816  
817  
818  
819  
820  
821  
822  
823  
824  
825  
826  
827  
828  
829  
830  
831  
832  
833  
834  
835  
836  
837  
838  
839  
840  
84